3.0 Transportation Analysis

The US Highway 53 Virginia to Eveleth Draft Environmental Impact Statement (EIS) (December 2014) is incorporated by reference and is considered part of the Final EIS. Parts of Chapter 3 from the Draft EIS that relate to the preferred alternative are repeated here, but it has been abbreviated.

3.1 Changes Since the Draft EIS

There have been no changes in the project setting or regulatory context or new technical studies since the Draft EIS that affect the transportation analysis. Changes in the project (described in Section 2.3.1.) that are relevant to the transportation analysis include the Midway area access change and the addition of the Mesabi Trail connection.

MnDOT will close the median at Cuyuna Drive, limiting that access point to a right-in/right-out only intersection. A new restricted median opening on US 53 at Vermillion Drive will be constructed to provide southbound traffic access to the Midway area. This median break will not allow left-turn movements from Vermillion Drive onto US 53. Access to southbound US 53 from the Midway area will be restricted to Bourgin Road. This median change will not change the results of the traffic analysis.

MnDOT has made allowance for the future Mesabi Trail to parallel the new road alignment between the new Landfill Road access and the existing trail segment west of the Rouchleau Pit. With this accommodation, there would still be a gap in the trail between the new and old Landfill Road access points. The St. Louis and Lake Counties Regional Railroad Authority (SLLCRRA) has identified an old railroad corridor under its ownership that crosses through the Iron Range Off-Highway Vehicle Recreation Area (OHVRA) and could be used to make a connection between the Landfill Road end of the trail accommodated on US 53 and the existing trail within the OHVRA, a distance of approximately 2,100 feet (see Figure 2.3-1). SLLCRRA has surface rights to the rail corridor and is willing to realign the trail to this location. The trail segment will be constructed by MnDOT but funded by state bonds through SLLCRRA.

3.2 Impacts of the Preferred Alternative

3.2.1 Traffic Volumes

Daily traffic volumes for the preferred alternative are expected to be similar to the traffic volumes on the existing easement segment, shown on Figure 3.1-1.

An at-grade intersection at US 53 and 2nd Avenue will increase access to US 53 over what is currently provided by the partial interchange at this location. Specifically, access to northbound US 53 from 2nd Avenue and to 2nd Avenue from southbound US 53 are movements that are not currently provided but will be provided with an at-grade intersection.

At MN 135 and US 53 the preferred alternative will provide free-flowing access for all movements as is provided under existing conditions.

3.2.2 Traffic Operations

Operational analysis of the existing US 53 corridor showed that the forecasted traffic volumes will be accommodated by a four-lane divided roadway and operate at acceptable level of service (LOS).[1] It is assumed that the preferred alternative, which is a four-lane roadway, will also provide acceptable LOS.

At 2nd Avenue the preferred alternative will have a three-legged intersection.[2] Replacing the existing interchange with an at-grade intersection will introduce two movements that do not currently exist (access to northbound US 53 from 2nd Avenue and access to northbound 2nd Avenue from southbound US 53). A sensitivity analysis completed for this intersection found that operations are acceptable until peak hour turning movement volumes reach 600 vehicles. At this volume, the intersection would operate at LOS C, with some movements experiencing LOS F. Higher levels of turns may require dual left turn lanes for southbound US 53; however, turning volumes of that magnitude are not seen at adjacent intersections and are not expected at this location.

At US 53 and MN 135, the interchange proposed as part of the preferred alternative will result in an acceptable LOS, both at project opening (2017) and in the future design year (2037) (Table 3.1-1). A compressed diamond interchange configuration will operate at acceptable LOS (LOS A or LOS B) at the ramp terminal intersections (see Table 3.1-1).

Table 3.2-1. Intersection Level of Service – Year 2017 and 2037

Intersection and Volume Assumptions	2017 LOS AM (PM)	2037 LOS AM (PM)
MN 135/US 53 Compressed Diamond Interchange[A]		
SB Exit Ramp Terminal NB Exit Ramp Terminal	A (A) B (B)	A (A) B (B)
2nd Avenue Intersection		
2nd Avenue and US 53 (200 vehicles assumed for unknown turning volumes)	B (B)	B (C)
2nd Avenue and US 53 (400 vehicles assumed for unknown turning volumes)	C (C)	C (C)
2nd Avenue and US 53 (600 vehicles assumed for unknown turning volumes)	C (D)	D (F; with dual left turn lanes: D)

[A] As unsignalized intersections, the LOS shown is the LOS of the worst case approach at the intersection.

3.2.3 Travel Times

Travel times for existing conditions and the preferred alternative were calculated based on the posted speed limits for all routes. Potential delays due to congestion or rail crossings were not accounted for in the calculations. Travel times for the four scenarios listed below were developed.

- Regional Travel: travel time from just south of the southern MN 37 interchange to 18th Street north of Virginia via US 53 (via MN 37/Co.7 for the No Build Alternative)
- Eveleth to Virginia: travel time to/from the intersection of Grant Avenue (Co. 302) and Pierce Street in Eveleth to Chestnut Street and 4th Avenue in downtown Virginia
- Gilbert to Virginia: travel time to/from the intersection of MN 37 and MN 135 in Gilbert to the intersection of Chestnut Street and 4th Avenue in downtown Virginia
- Interregional Travel: travel time from Duluth to International Falls via US 53 (via MN 37/Co.7 for the No Build Alternative)

[1] Roadway operations were estimated using a Level of Service (LOS) measure that is based on the amount of congestion experienced by motorists. Congestion is rated from A to F, with LOS A representing free flow with no congestion and LOS F representing high levels of congestion with very long delays and slow speeds. The LOS D/LOS E boundary was used as the US 53 performance measure for LOS.

[2] A three-legged intersection is an intersection with three approaches.

Travel times will generally be slightly higher than travel times today on US 53 due to delay at the additional signalized intersection at 2nd Avenue and due to minor increases in distance; however, this delay will not be substantial (approximately one to three minutes), as shown in Table 3.2-1.

Table 3.2-1. Travel Time for the Preferred Alternative[A]

Scenario		Distance (miles)	Travel Time (minutes)
Regional Travel	From MN 37 (South Interchange) to Virginia	10.7 (+1.5)	14.5 (+2.8)
	From Virginia to MN 37 (South Interchange)	10.7 (+1.5)	14.5 (+2.8)
Eveleth to Virginia	From Eveleth to Virginia	6.4 (+1.4)	12.8 (+2.6)
	From Virginia to Eveleth	6.4 (+1.4)	11.9 (+3.5)
Gilbert to Virginia	From Gilbert to Virginia	6.2 (+1.3)	10.7 (+2.2)
	From Virginia to Gilbert	6.2 (+1.3)	10.2 (+2)

[A] Access to Chestnut Street and 4th Avenue was assumed via 2nd Avenue to 4th Street within Virginia.
Note: Numbers in parentheses indicate additional time compared to the existing condition.

Inter-regional travel times will be only slightly increased with the addition of a signalized intersection in place of the existing interchange at 2nd Avenue. Using delays reported in the detailed intersection analysis, the average delay for through traffic on US 53 due to the addition of a signalized intersection, depending on the direction and time of day, ranges from one to two minutes in the 2037 peak hours. Considering the total inter-regional corridor between Duluth and International Falls is 163 miles, around three hours if a 55 mph average is used, the worst-case incremental increase in delay represents a one percent increase in total inter-regional travel time.

3.2.4 Access

MnDOT will close the median at Cuyuna Drive, limiting that Midway area access point to a right-in/right-out only intersection. A new restricted median opening on US 53 at Vermillion Drive will be constructed to provide southbound traffic access to the Midway area. This median break will not allow left-turn movements from Vermillion Drive onto US 53. Access to southbound US 53 from the Midway area will be restricted to Bourgin Road. This median change will not change the results of the traffic analysis.

MnDOT identified a sight distance and safety concern (high crash rates) at the Cuyuna Drive area and decided it needed to correct this issue while this segment of road was being reconstructed. It held several meetings with the city of Virginia and residents to discuss access options, since closing the median at Cuyuna Drive would limit the Midway are to one full access to/from US 53. New median breaks were considered at several locations between Cuyuna Drive and Bourgin Road, Some lining up with existing streets and others mid-block. Mid-block options were met with opposition due to new impacts to residents (such as light glare from turning vehicles). Points south of Vermillion Drive were already being served by the Bourgin Road median break. The compromise solution was to break the median at Vermillion Drive for southbound US 53 traffic only, to allow reasonable access to businesses between Vermillion and Cuyuna Drives. This access change is not expected to result in any noticeable changes to traffic patterns in this area.

3.2.5 Safety

The existing US 53 corridor from MN 37 (East) to 12th Avenue experienced a higher than expected number of crashes during snowy or icy conditions in 2007 to 2011. Under the preferred alternative, traffic volumes and road capacity will not change. MnDOT will continue implementation of its weather-related safety changeable message signs. In addition, an epoxy-chip friction course will be added to the bridge surface and a Road Weather Information Station (RWIS) will be replaced to help MnDOT monitor weather and roadway surface conditions in the project area. A 42-inch tall concrete barrier will separate roadway traffic from trail users on the bridge. The median modification in the Midway area will improve sight distance for turning movements to/from the Midway area.

3.2.6 Intermodal Transportation

3.2.6.1 Bicycles and Pedestrians

MnDOT's action of vacating its US 53 easement segment (just southwest of the Rouchleau Pit), through which the Mesabi Trail runs, will not directly impact the Mesabi Trail, which has its own separate easement. Potential trail impacts by others are discussed in Chapter 7: Cumulative Impacts. The termination of the MnDOT easement by RGGS/UTAC does not directly affect the Mesabi Trail.

The preferred alternative will cross the existing Mesabi Trail at several locations. MnDOT will grant a permit along the eastern edge of the new alignment (between the new Landfill Road access and the trail on the west side of the Rouchleau Pit) to accommodate the realigned Mesabi Trail (to be reconstructed as part of the project but funded by state bonds through SLLCRRA (see Section 4.4 for more details)). East of Landfill Road, the trail connection described in Section 2.3.1.4 and Section 3.1, which is on an existing abandoned rail corridor owned by SLLCRRA, will link to the existing Mesabi Trail within the OHVRA. This alignment allows for a continued connection of the trail between Virginia and the OHVRA for pedestrians, bicycles, and snowmobiles.

3.2.6.2 Bus Transit

While introducing slightly longer travel distance (approximately 1.3 to 1.5 miles) and travel times, the preferred alternative will have a minor impact on the existing transit service that is offered within the study area.

3.2.6.3 Rail

Existing railroad lines and crossings will not be impacted by the preferred alternative.

3.2.6.4 Aviation

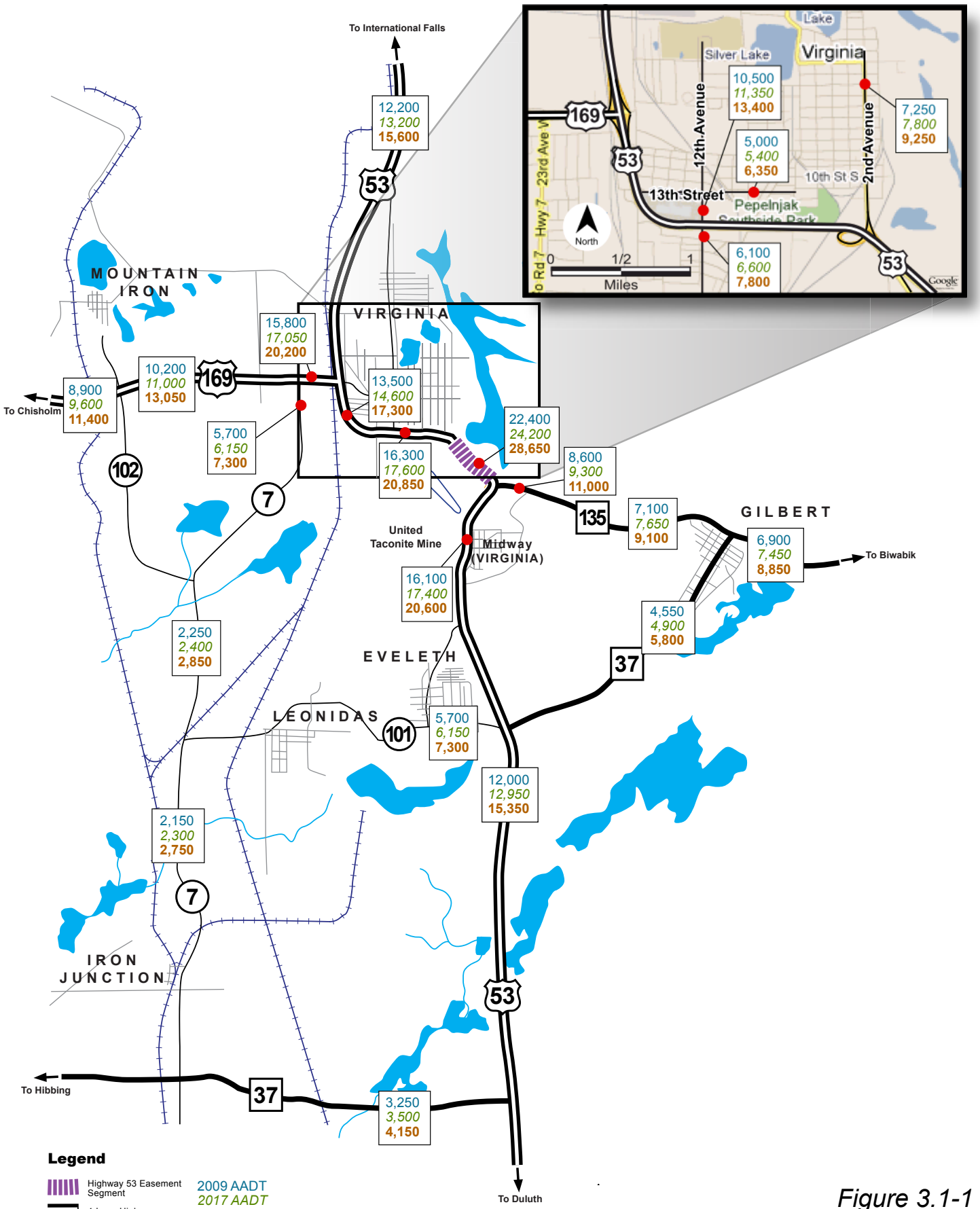
The preferred alternative will not impact the Eveleth-Virginia Airport located southeast of Eveleth (Figure 1.0-1) or substantially increase local travel time to/from the airport.

3.2.6.5 Other Transportation Modes

The preferred alternative will have a minor (approximately two to 3.5 minutes) increase to the travel times of school buses or emergency service vehicles.

3.3 Mitigation Measures

There will be no adverse effects on traffic volumes, traffic operations, travel times, or safety due to the preferred alternative; therefore, no mitigation is proposed.



Source: Traffic Analysis Technical Report (2013)

SEPTEMBER 2015

MINNESOTA DEPARTMENT OF TRANSPORTATION

Figure 3.1-1
Existing and Forecast Traffic Volumes on US 53
US Highway 53 Virginia to Eveleth
Final Environmental Impact Statement